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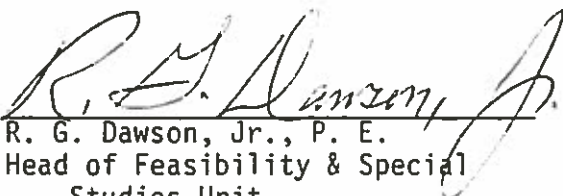
FEASIBILITY STUDY

NC 12
From Whalebone
To Southern Shores
Dare County
R-2400

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation



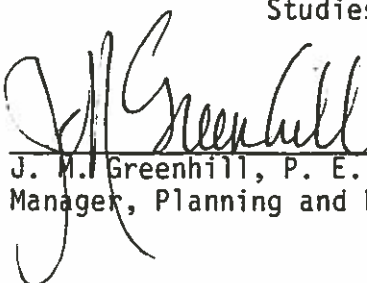
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I. GENERAL DESCRIPTION

This report covers the proposed improvement of NC 12 from its intersection with US 158 and US 64-264 in Nags Head to its intersection with US 158 at the Southern Shores-Kitty Hawk Town Limits (see Figures 1 and 2). The project is 15.0 miles long and is located in the towns of Nags Head, Kill Devil Hills, and Kitty Hawk. This project is included in the 1988-1996 Transportation Improvement Program for feasibility study and/or right-of-way protection.

II. PURPOSE OF PROJECT

Existing Route Characteristics

NC 12 is one of two north-south routes running from Whalebone junction in Nags Head to Southern Shores (the other route being US 158). NC 12 is included in the Adopted (1973) Nags Head-Kill Devil Hills Thoroughfare Plan as a Major Thoroughfare. It is also included as a Major Thoroughfare in the unadopted 1988 Dare County Thoroughfare Plan. NC 12 is classified as a Rural Major Collector in the North Carolina Functional Classification System and is a Federal Aid Secondary Route.

The existing cross section on NC 12 consists of a 20-foot paved roadway with 6 to 10-foot unpaved shoulders. There is a 60-foot dedicated right-of-way symmetrical about the existing centerline for the entire length of the project except for an approximate 1 mile segment near Danube Street in Nags Head which has 30 feet of right-of-way on the east side of NC 12 and 40 feet on the west side for a total right-of-way width of 70 feet. The existing vertical and horizontal alignments are good. With the level terrain, the grade on the roadway is flat throughout the project length. The horizontal alignment is also straight with the exception of the curves on either end and at the recently relocated section of NC 12 in Nags Head. All intersections along the project are at grade. The intersections at both project terminals are signalized while all other intersections are stop sign controlled. The speed limit throughout the project length is 35 mph.

The adjacent sections of NC 12, to the north and south of the project, are both 2-lane shoulder cross sections similar to the project. South of Whalebone, NC 12 widens to a 22-foot paved roadway, and north of project, NC 12 has a 20-foot paved roadway.

Drainage is poor throughout the project length. Most of the project has no ditches or lateral drains. This results in water standing on the highway following heavy rainfalls.

Roadside development is of high density throughout most of the project length. There are some undeveloped areas near the southern end of the project; however, these are disappearing as the entire area is undergoing intense development. The open area appearing on Figure 2 where the highway has been relocated is being developed at the present time, and several other areas appearing vacant in this 1984 photograph have already been developed.

Traffic Volumes, Capacity, and Accident Record

The current average traffic volumes on NC 12, on a year-round basis, range from a high of 6,000 vehicles per day (vpd) in Kill Devil Hills to a low of 2,500 vpd near the northern end of the project. During the summer months, the week day volumes increase to a high of 13,200 vpd and a low of 4,000 vpd with weekend summer volumes being even greater. By the year 2010 the average year-round traffic is projected to increase to a high of 10,700 and a low of 4,600, and the weekday summer volumes are expected to range from 7,500 vpd to 20,000 vpd. With present traffic volumes, NC 12 is operating at Level of Service D on a year-round basis and Level of Service E during the summer months. Level of Service E is characterized by congestion and traffic delays. If the roadway is not improved, the level of service will deteriorate to Level of Service F during the summer months by the end of the planning period. With the proposed improvements to NC 12, the level of service will initially be raised to Level of Service C on a year-round basis and Level of Service D for the summer months. By the end of the planning period, NC 12 will be operating at Level of Service D year-round and Level of Service E during the summer. However, additional improvements needed to substantially improve these levels of service would be very costly from a right-of-way standpoint.

During the four-year period from January 1, 1985 through December 31, 1988 a total of 118 accidents were reported on the studied portion of NC 12. This resulted in an accident rate of 45.1 accidents per 100 million vehicle miles (ACC/100 MCM), which compares favorably to a statewide average of 312.4 ACC/MCM for all two-lane, urban NC routes over the same period. There was 1 fatality during the period, and 50 of the accidents resulted in injuries. The primary accident types were rear-end and left-turning accidents that were located near intersections. There were also 8 accidents involving pedestrians during the period including the 1 fatality. The provision of left-turn lanes at specific locations and paved shoulders where pedestrians can walk outside of the travel lanes should reduce the potential for these types of accidents.

Need for Project

An improvement of NC 12 is needed to provide more capacity for the existing and future traffic volumes. The proposed improvements to the drainage system are also needed to eliminate the flooding problems on existing roadway. The project will also enhance the safety of NC 12 for motorists, bicyclists, and pedestrians.

III. RECOMMENDATIONS AND COSTS

An improvement of NC 12 to provide a wider two-lane facility is immediately warranted. The recommended cross section is a 24-foot paved roadway with 4-foot paved shoulders and total usable 8-foot shoulders. This cross section will provide a wider roadway for motor vehicles travelling on NC 12, and the paved shoulders will provide a strip where bicycles and pedestrians can travel outside of the vehicular travel

It is also recommended left-turn lanes be provided at Mall Drive, Barnes Street, Ocean Acres Drive, Ocean Bay Boulevard, Third Street, Eighth Street, Kitty Hawk Road, and Eckner Street. These streets are the major east-west connectors, and each has a signalized intersection with US 158. Due to the heavy surrounding development and high land prices, the proposed widening must be contained within the existing 60-foot right-of-way. In order to stay within this right-of-way, it may be necessary to reduce paved roadway width to 22 feet on the two-lane portions of NC 12 (30 feet where left-turn lanes are provided), and to reduce the paved shoulder width to 3 feet. These widths were used on the recently improved section of NC 12 through Duck in order to stay within the existing right-of-way. It is further recommended that efforts be made to improve the drainage on NC 12. These drainage improvements may include connections to existing ocean outfalls or the use of special drainage structures to drain the roadway and hold the water until it can soak into the ground. The use of curb and gutter is not recommended for the project because of the difficulty involved with draining a roadway with a flat grade, maintenance problems with blowing sand, potential ponding, and increased costs. The specific improvements will have to be determined during the design of the project following a hydrographic survey.

The estimated costs of the project are as follows:

| | |
|--------------|------------------|
| Construction | \$ 9,100,000 |
| Right-of-Way | <u>1,000,000</u> |
| TOTAL | \$10,000,000 |

The construction cost includes engineering and contingencies and the right-of-way cost is for utilities and drainage easements.

IV. ALTERNATIVES CONSIDERED

Since the project involves the widening of an existing highway within an existing right-of-way, no alternative alignments were considered.

The provision of a three-lane cross section throughout the project length was considered. This cross section would allow the use of a continuous left-turn lane. However, since most of the development along NC 12 is single family residential development, with relatively low turning volumes, the extra cost of the third lane is not justified. The restricted right-of-way eliminated the consideration of any cross sections wider than three lanes to provide adequate capacity for the anticipated traffic volumes.

V. ENVIRONMENTAL EFFECTS

The implementation of the proposed project is not expected to result in any significant impacts on the environment. The project will result in increased noise levels for development adjacent to the roadway. Other impacts will be primarily related to the actual construction of project and will cease upon completion of the project. These include minor erosion and siltation, increased noise levels from construction machinery, and delay and inconvenience to motorists using NC 12.

Because of the close proximity of the Atlantic Ocean in the Kitty Hawk area, the construction of the project may require a CAMA permit.

VI. LONG TERM OUTLOOK FOR NC 12

The shoreline on the northern portion of the project has been undergoing severe erosion over the past few years. As can be seen on Figure 2, the shoreline is much closer to NC 12 between the northern project terminal and Third Street in Kill Devil Hills. The area just south of Kitty Hawk Road was subjected to especially severe erosion during a series of "northeasters" this past winter. During these storms, the shoreline eroded to within a few feet of NC 12, exposing the water line that runs down the shoulder of the highway.

Since this portion of the North Carolina Coast is subjected to severe winter storms from the northeast that often result in extensive erosion, further beach erosion can be expected in the future. If extensive erosion continues on the northern portion of the project, NC 12 will be threatened by potential undermining.

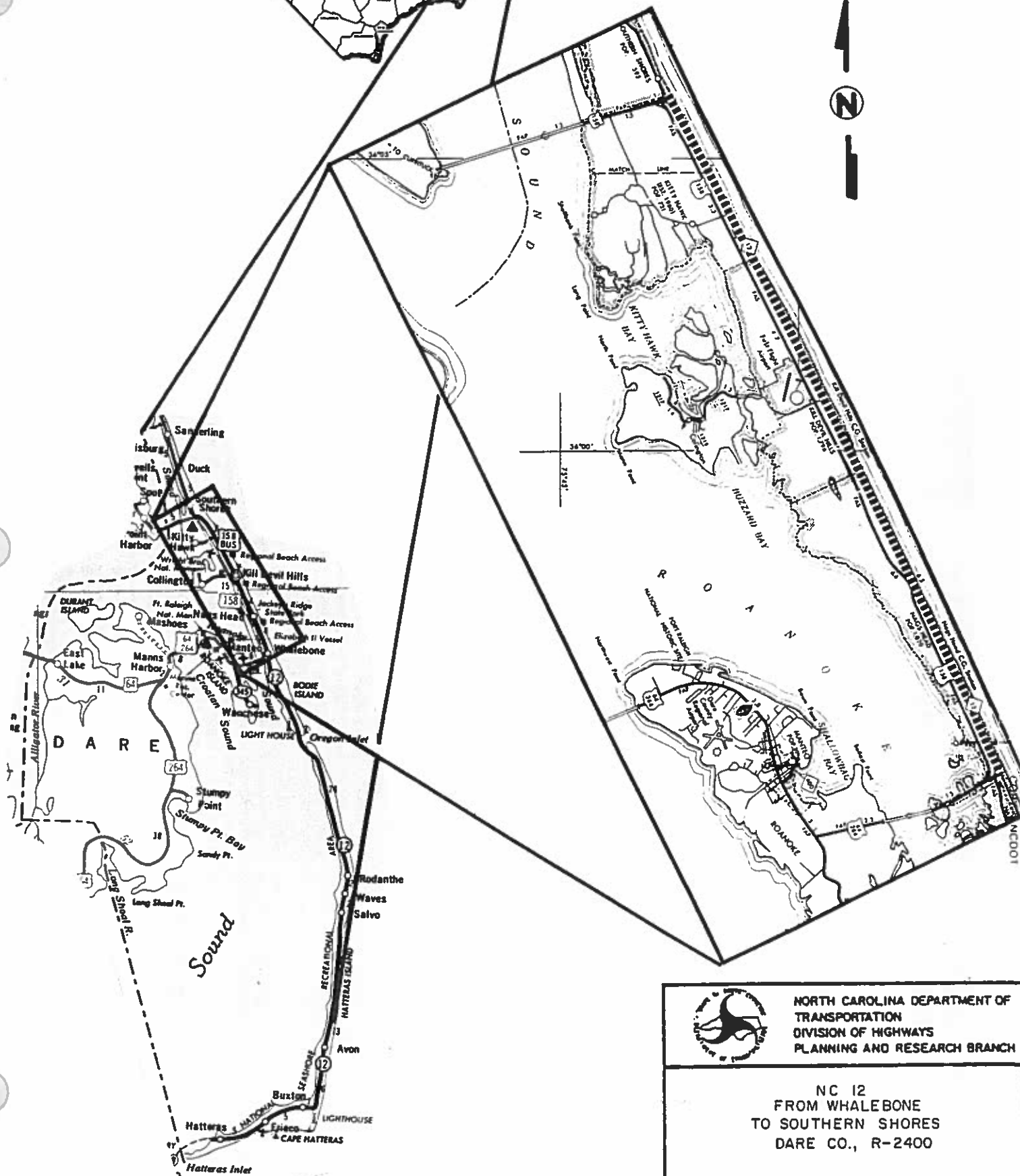
NC 12 is an important north-south route. It is one of only two routes running the entire length from Southern Shores to Whalebone, providing much needed relief to US 158 Bypass and serving as an alternate route for emergency vehicles when US 158 becomes congested. If NC 12 is to remain open in the future, measures will need to be made either to protect the existing roadway or to relocate it further inland. If the roadway is to be protected, extensive beach nourishment and dune building or some form of shoreline hardening will be needed. If these measures are found to be unfeasible or are not permitted under existing laws and regulations, the roadway will have to be relocated inland. Paralleling roads presently exist for portions of the threatened area, but in order for them to replace NC 12, connections would need to be made between them. If relocation is the chosen alternative, efforts should begin soon to protect corridors for the connector roads.


The final solution for the erosion problem threatening NC 12 is beyond the scope of this report. However, a research study is underway that will examine such factor as storms, erosion rates, and their impacts on coastal highways along with potential alternatives for the roadway including protection of the roadway, relocation of the roadway, and abandonment. When the results of this study have been compiled and analyzed, the NCDOT will be in a better position to select the best alternative for this area.

VII. FUTURE ACTIVITIES

If the project is to be implemented at a future date, all feasible alternatives and their associated impacts will need to be evaluated in a planning/environmental document prior to that time, and a final decision made as to the most appropriate improvement.

RBD/sdt





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**NC 12
FROM WHALEBONE
TO SOUTHERN SHORES
DARE CO., R-2400**

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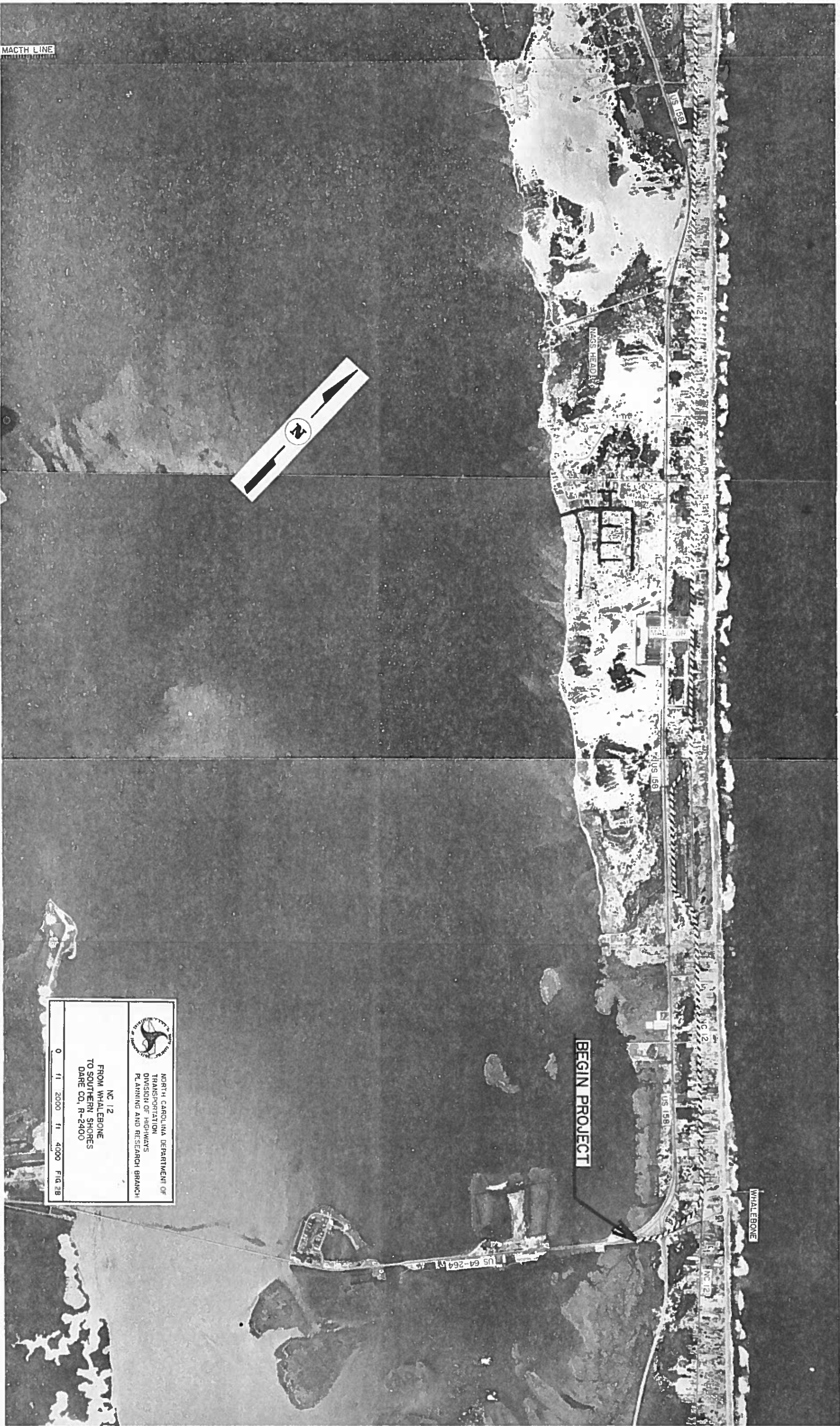


FIG. 1



MAGTH LINE

2

BEGIN PROJECT

WHALEBONE

US 158

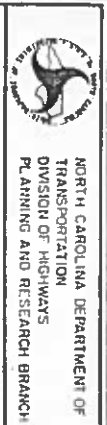
NC 12

MAGS HEAD

US 158

US 158

US 64-264 W. A.



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NC 12
FROM WHALEBONE
TO SOUTHERN SHORES
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0 11 2000 11 4000 FIG. 2B

MATCH LINE

THIRD STREET

KILL DEVIL HILLS

OCEAN BAY BLVD

US 128

US 128

OCEAN ACRES DR

TOWN LIMITS

US 128

BARNES ST

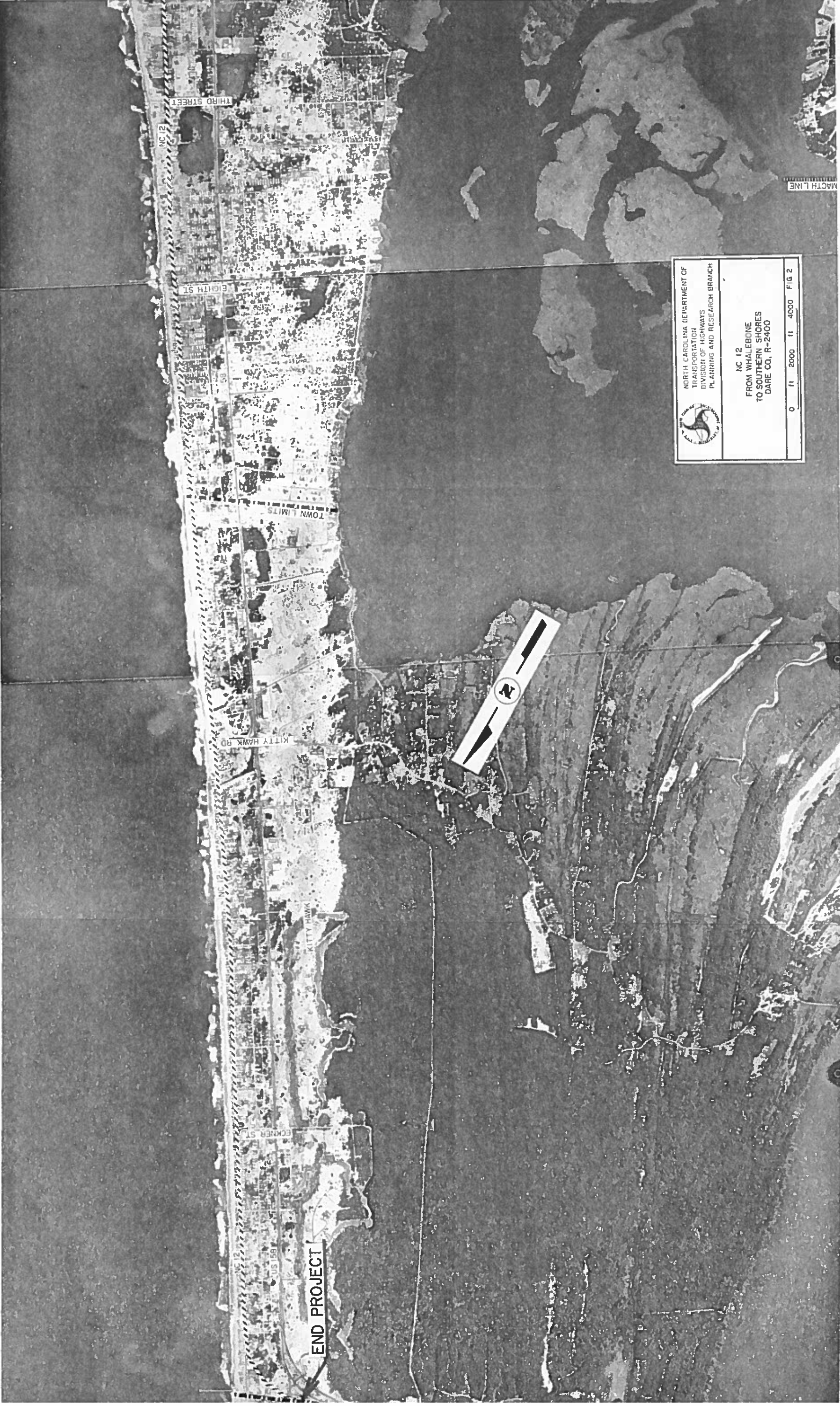


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0 11 2000 11 4000 FIG. 2A

MATCH LINE



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